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10/566,849	05/09/2006	Karl-Heinz Schuster	18239-039US1 / 04091PW0US	9757
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EXAMINER				
WHITESSELL GORDON, STEVEN H				
ART UNIT		PAPER NUMBER		
2851				
NOTIFICATION DATE		DELIVERY MODE		
07/09/2008		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Office Action Summary

Application No.

10/566,849

Applicant(s)

SCHUSTER, KARL-HEINZ

Examiner

Steven Hunt Whitesell-Gordon

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 38 and 40-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 38 and 40-42 is/are rejected.
- 7) ☒ Claim(s) 38 and 40-42 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 11/27/2006, 1/8/2007
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Acknowledgement is made of Preliminary Amendments filed 1 February 2006 and 10 November 2006. Claims 1-37, 39 and 43-45 have been cancelled, claims 38, 40-42 are currently amended.

Information Disclosure Statement

2. The information disclosure statement filed 27 November 2006 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. Specifically, the other references that have been lined through.

Claim Objections

3. Claims 38 and 40-42 are objected to because of the following informalities:
- a. Claim 38, line 2, "the image side" should be changed to "an image side" or "the image side of the projection lens" in order to clarify the object that is related to the image side.
 - b. Claim 38, line 6, "S/m" should be inserted after 4×10^{-6} so that the number is associated with a measured property.
 - c. Claim 40 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

The range in line 3 of "about 3.5×10^{-8} S/m and about 6×10^{-7} S/m" overlaps, but is not within the range of "about 4×10^{-8} S/m and about 4×10^{-6} S/m" of claim 38, and therefore fails to further limit independent claim 38.

d. Claims 40-42 indicated as "new" in the preliminary amendment filed 10 November 2006 should be rewritten as "previously presented" or "currently amended" to correctly reflect the current claim status of claims 40-42.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 38, 40-42 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, Claims 38 and 40 recite immersion liquid containing highly pure water with an electrical conductivity below the fundamental minimum electrical conductivity of highly pure water (see Light et al. "The Fundamental Conductivity and Resistivity of Water"). Further, it would be counter intuitive and unpredictable to one of ordinary skill in the art at the time of the invention that the addition of additives consisting of LiF, NaF, CaF_2 , SrF_2 , or MgF_2 , recited in claim 42 would decrease the electrical conductivity of the immersion fluid containing highly pure water when they

Art Unit: 2851

dissociate into electrolytes in the immersion liquid. Additionally, the disclosure does not give direction or guidance to an amount of additive necessary to dissociate in the immersion fluid so that the conductivity of the immersion fluid is between about 4×10^{-8} S/m and about 4×10^{-6} S/m or 3.5×10^{-8} S/m and about 6×10^{-7} S/m, where the immersion fluid consists of highly pure water. Further, there is no description of an additive beyond water or LiF, NaF, CaF_2 , SrF_2 , or MgF_2 , that would reduce the electrical conductivity below that of highly pure water. It is disclosed that experimentation has shown relatively low ion concentrations in the water significantly reduce its chemical reactivity, it is not disclosed how these relatively low ion concentrations reduce the electrical conductivity of the water. The amount of experimentation in order to achieve an immersion liquid, containing highly pure water and the addition of LiF, NaF, CaF_2 , SrF_2 , or MgF_2 , with an electrical conductivity below the fundamental electrical conductivity of water is undue.

Claim Rejections - 35 USC § 102 & 103

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 38 and 40-42 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yeo et al. [US 2005/0036183].

For claims 38, 40 and 42, a projection exposure apparatus, comprising a projection lens 40 having a last optical surface 50 on the image side that is immersed in an immersion liquid 60 that contains highly pure water (see [0034]) and at least one additive contains at least one of the group consisting of: LiF, NaF, CaF₂, SrF₂, or MgF₂ that dissociates in the water (Sodium Fluoride provides Fluorine ion, see [0047]) and is, in the dissociated state, transparent for the projection light used in the projection exposure apparatus, wherein the at least one additive dissociates in the immersion liquid so that the electrical conductivity of the immersion liquid is between about 4×10^{-8} S/m and about 4×10^{-6} S/m or is between about 3.5×10^{-8} S/m and about 6×10^{-7} S/m (chemicals of identical composition can not have mutually exclusive characteristics, in this case sodium fluoride added to water dissociates as disclosed by applicant in [0041]-[0042] of instant application, see also MPEP 2112.01(II)).

Yeo does not appear to explicitly disclose the at least one additive dissociates in the immersion liquid so that the electrical conductivity of the immersion liquid is between about 4×10^{-8} S/m and about 4×10^{-6} S/m or is between about 3.5×10^{-8} S/m and about 6×10^{-7} S/m .

Yeo discloses adding additives to the immersion fluid in order to reduce the reactivity between the immersion fluid and final element of the projection lens (see [0047]) similar to limited reactivity of the immersion fluid disclosed by the Applicant in paragraph [0041] of the instant application.

The photolithographic art well recognizes that the reactivity of the immersion fluid with the final optical element of the projection lens effects the exposure of a substrate with resist, including lifetime and integrity of the final optical element. The reactivity of the immersion fluid with the final optical element is therefore an art recognized result affecting parameter.

According to well established patent law precedent (see, for example, M.P.E.P. § 2144.05) therefore it would have been obvious to determine (for example by routine experimentation) the optimum amount of additives necessary to effect the electrical conductivity and reactivity of the immersion fluid for a specific design.

For claim 41, the highly pure water contains heavy water (heavy water naturally found in water, see page 2 paragraph 2 of "Heavy Water").

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Hunt Whitesell-Gordon whose telephone number is (571)270-3942. The examiner can normally be reached on Monday to Thursday, 9:00 AM - 6:00 PM EST.

Art Unit: 2851

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on 571-272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Peter B. Kim/
Primary Examiner, Art Unit 2851

/SHW/
7/2/2008